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United States Patent [19]**Glenning et al.**[11] **Patent Number:** **6,058,874**[45] **Date of Patent:** **May 9, 2000**[54] **RADIO FREQUENCY COMMUNICATIONS
FOR UNDERWATER VEHICLE**5,377,165 12/1994 LaPointe 114/328
5,379,034 1/1995 O'Connell 114/328[75] **Inventors:** **Daniel M. Glenning**, Newport;
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Navy**, Washington, D.C.[57] **ABSTRACT**[21] **Appl. No.:** **09/113,010**[22] **Filed:** **Jun. 26, 1998**[51] **Int. Cl.⁷** **B63G 8/40**[52] **U.S. Cl.** **114/328; 114/244; 340/850;
343/709**[58] **Field of Search** **114/328, 242,
114/244, 249, 251, 253; 340/850; 343/709**[56] **References Cited**
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An antenna arrangement for a submerged submarine includes an independently functioning underwater vehicle free of any tethered connection to said submarine, a buoy member having a hydrodynamic shape, an antenna mounted on the buoy member, the antenna enabling collection and transmission of at least global positioning data and radio frequency communications, a releasable connector for securing the buoy member to said underwater vehicle in a primary non-deployed position, and a tether connection the buoy member to the underwater vehicle in a secondary deployed position. Release of the connector deploys the buoy member and the antenna such that the hydrodynamic shape of the buoy member raises the buoy member to a data collection and transmission position at a surface of the water.

13 Claims, 2 Drawing Sheets